

BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

LeRoy Koppendraye  
Ellen Gavin  
Marshall Johnson  
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Gregory Scott

Chair  
Commissioner  
Commissioner  
Commissioner  
Commissioner

In the Matter of a Petition by Dakota Electric  
Association for Approval to Implement a  
Geothermal Heat Pump Rate

ISSUE DATE: February 27, 2003

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ORDER APPROVING RATE

**PROCEDURAL HISTORY**

On October 17, 2002, Dakota Electric Association (Dakota) filed a petition asking the Commission to approve its proposed Rate Schedule 42 for powering geothermal heat pumps.

On November 20, 2002, the Minnesota Department of Commerce (the Department) filed comments on this matter.

On December 2, 2002, Dakota filed reply comments.

On December 16, 2002, the Department filed supplemental comments.

On January 22, 2003, Dakota filed a letter of agreement.

The matter came before the Commission on February 6, 2003.

**FINDINGS AND CONCLUSIONS**

**I. Background**

**1. Dakota Electric Association**

Dakota Electric Association is a cooperatively-owned electric distribution utility serving 86,000 customers in Minnesota. Dakota does not generate its own electricity; rather, it purchases the electricity from a wholesale supplier and distributes it to its customers.

## **2. Rate Design**

The cost of providing electricity to a customer depends upon the customer's pattern of consumption, or "load profile." A residential customer's load profile typically differs from the profile of a commercial or industrial customer. Consequently, the formula that a utility uses to calculate a customer's electricity bill depends upon the customer's load profile. Dakota, for example, has a separate formula for service offered to small general service customers (Rate Schedule 41), general service customers (Schedule 42), large power general service customers (Schedule 43) and large commercial and industrial customers (Schedule 48), among others. The formula in each schedule is designed to reflect the cost of serving customers with the load profile appropriate to that schedule.

## **3. Heat Pumps**

A heat pump is a technology for heating and cooling. It heats a building by transferring heat from outside the building to inside; it cools a building by transferring heat from inside a building to outside.

A heat pump operates more efficiently when the area to which it seeks to transfer heat is relatively cool, and the area from which it seeks to take heat is relatively warm. For example, on a hot day a standard heat pump seeks to take heat from the interior of a building (relatively cool) and transfer it to the air outside a building (relatively warm). The warmer the outdoor temperature, the more energy the heat pump requires to cool the building.

A geothermal heat pump transfers heat between a building and a fluid that circulates in tubes embedded in the earth. Unlike air temperature, the earth's temperature tends to remain at a stable 40 to 50 degrees Fahrenheit year round. A heat pump requires less energy to extract heat from the ground than from the air on a cold winter's morning; it requires less energy to transfer heat to the ground than to the air on a hot summer's night.

Customers who install a geothermal heat pump instead of a standard heat pump can reduce their energy consumption, thereby reducing their energy costs. More significant to the current docket, they may help electric utilities reduce costs as well. In particular, heat pumps reduce the amount of energy demanded during periods in which customer demand on the utility's system is greatest and electricity is most expensive.

## **II. The Petition**

Dakota proposes to offer a new rate for the electricity used to power geothermal heat pumps, but only to general service customers buying service according to the terms of Schedules 41, 42, 43 and 48. This new rate would reflect some of the cost savings that a geothermal heat pump provides to Dakota, and may help encourage more customers to install the technology.

Dakota calculates its proposed rate based on two factors: 1) Dakota's wholesale cost of electricity and 2) Dakota's cost of distributing energy as reflected in Schedule 42.

### **III. Department Analysis**

The Department generally supports Dakota's proposed geothermal heat pump rate. But Department did not see the merit in using the distribution costs from Schedule 42 to design rates for customers who otherwise qualify for service under other rate schedules. Evidence from Dakota's last rate case suggested that the proposed rate would subsidize Schedule 41 customers (which have relatively high distribution costs) at the expense of Schedule 43 and 48 customers (which have relatively low distribution costs).

To remedy this problem, the Department identified various alternative solutions:

- Recalculate the proposed rate's distribution cost based on the aggregate distribution costs of all four schedules.
- Offer a separate geothermal heat pump rate for the customers of each schedule, based on each schedule's distribution costs.
- Offer the proposed rate only to Schedule 42 customers, at least for the present.
- Delay offering the new rate until Dakota can provide updated information about the distribution costs of Schedule 41, 42, 43 and 48 customers, or until Dakota's next general rate case, when the cost components of all rates could be reconsidered.

### **IV. Dakota Response**

While Dakota and the Department did not come to a full agreement with respect to these issues, neither party objects to offering the new service to Schedule 42 customers. Without surrendering its interest in offering the proposed rate more broadly, Dakota joins with the Department in recommending that the rate be approved for use by those customers.

### **V. Commission Action**

Having reviewed Dakota's proposal and the parties' comments, the Commission finds the proposed resolution reasonable and will adopt it. The Commission will so order.

**ORDER**

1. Dakota Electric Association's Geothermal Heat Pump Rate is approved for use by customers receiving service pursuant to Dakota's Rate Schedule 42.
2. This Order shall become effective immediately.

BY ORDER OF THE COMMISSION

Burl W. Haar  
Executive Secretary

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